Occupational hygiene education - the global approach

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Access to occupational hygiene education has historically been linked to those countries with a developed economy or countries where professional expertise has been available to establish and foster such programmes.

As industry has located operations in countries where no occupational hygiene education programmes have existed, there has been a reliance on expatriate resources or the training of local resources in foreign countries. While such actions have solved immediate issues they have not led to increased local educational resources and thus limited local training has occurred, giving rise to critical shortages in many developing countries.

In 2006 a number of senior occupational hygienists from multinational corporations, pooled their collective ideas as to how this demand for occupational hygienists (and occupational hygiene technicians) could be addressed.

From these early concepts the process has grown into a truly multinational project to improve worker health through the provision of appropriate education under the banner of the “Occupational Hygiene Training Association (OHTA)”. This project is supported by the International Occupational Hygiene Association (IOHA) and its member organisations.

The OHTA project delivers a means of growing occupational hygiene skills using a modular system of training and qualifications. The system has been developed through extensive consultation over the last four years and provides a system of standard training packages that can be accessed free of charge anywhere in the world from www.OHlearning.com. All materials have been peer reviewed and trialled before release. The concept is based on standardised, modular training and student assessment to a consistent format. It focuses initially on the development of basic and practical occupational hygiene skills at the technical level to identify, assess and control risk.

While the initial focus has been at the technical level, several members of the OHTA Leadership Group have been working to develop specialist modules in a number of areas for incorporation into academic programmes at the Masters Degree level. To date, two universities, located in Australia and Chile, are offering programmes based on the OHTA modules and more specialists areas of expertise (eg Mining, Oil & Gas, Hypoxia). It is envisaged that other universities will also progress down this pathway and ultimately seek national (or international) accreditation of their courses.

OHTA, through the support of many individuals and organisations across the world, has evolved quickly and with the launch of www.OHlearning.com has the potential to change the way occupational hygiene education has been delivered. The OHTA approach to education materials, facilitates translation into other languages, reduces costs and increases the potential for local development of occupational hygiene education and occupational hygienists.

Key words: Education, training, OHTA, competencies

Introduction

At the 2005 IOHA Conference, Guillemin (Guillemin, 2006) delivered a keynote lecture on the status and global trends in occupational hygiene education. He stated in part that education and training in occupational hygiene depended on the cultural roots of a nation, on its research capacity and policy, on its legal framework and on the perception and understanding of this field by the stakeholders.

In his concluding statement he suggested the future depended on the capacity of the profession to learn from the lessons of the past to build up a new image of the required core competencies. He went on to suggest that this held true in two words: courage and creativity.

In the past four years a project, operating under the banner OHTA, has embraced these concepts of courage and creativity to develop a new approach to occupational hygiene training. While the initial focus of the project has been at the technical level so as to meet the immediate needs of industry, work has also been underway to develop academic programmes at the Masters Degree level, with an aim of producing graduates who have good practical skills underpinned by a sound academic background.

The journey of OHTA from conception to delivered outcomes has been extraordinary, not just in terms of teaching materials but the involvement of so many occupational hygienists from so many countries, all with the same desire to make a difference and thus enhance the profession.

Historical Perspective

Guillemin (Guillemin, 2006) stated that a comprehensive survey on occupational hygiene training and education requirement had not been carried out. While this may be the case there is no shortage of public comment on the issue by practicing occupational hygienists. For the most part occupational hygienists in many parts of the world have suggested that the profession is entering a stage of decline, as discussed in some detail by Guillemin in 2006. The basis for this concern was a decrease in the membership of professional societies in developing countries, most notably North America.

While the concerns of a decline in the level of participation in the profession in some developed countries may have supporting evidence, independent research (Deloitte, 2007) suggested that there was a significant need for trained professionals in the field of occupational hygiene in many parts of the world, albeit not necessarily areas where occupational hygiene had been historically established. Moreover, the research indicated that the criti-
cal need was at the technician (intermediate) level and that the lack of suitable training programmes was a barrier to the development of profession in these countries. This research led to the development of a major global training project, funded by industry in the development stages, which is now operating under the OHTA banner.

Australia, which has a strong professional society and significant demand for trained occupational hygienists (mainly in the resources sector), has, over the years, had limited opportunity for new entrants to the field to gain adequate education and training. Prior to the mid 1970’s training was mainly conducted “in house” within major companies or government bodies, with only a few individuals in the field having higher degrees obtained overseas.

In 1977 a 13 week intensive course in occupational hygiene was introduced by the Federal Government at the School of Public Health & Tropical Medicine at Sydney University. This course was unique in that it was focussed on practical training with a strong scientific background and used practising hygienists as lecturers in many aspects of the course. During the 20 year period of its existence, either at Sydney University or WorkSafe Australia, 165 practitioners from industry and government attended, and by 1996 the Alumni made up approximately 85% of the core senior occupational hygienists in Australia. Sadly, Federal Government policy saw this course terminated in 1996.

In 1994 the first Australian Institute of Occupational Hygienists (AIOH) accredited course was approved at Deakin University and while other universities have offered programmes with an occupational hygiene component, Deakin was the only accredited course in Australia. This changed in 2009 with the programme at the University of Wollongong, which grew out of the OHTA project, receiving accreditation by both the AIOH and British Occupational Hygiene Society (BOHS).

As part of the development of the OHTA project, Masters level academic programmes are being developed in the areas of the world where there is a need, with the first of these commencing in May 2010 at the University of Antofagasta in Northern Chile. The experience of the Leadership Group of OHTA, based on the need for educational courses in some developed countries is declining, there is an urgent need in other parts of the world for good quality practical training underpinned by academic excellence. In the first two months after www.OHlearning.com was launched, it was accessed over 6,400 times by individuals from 89 countries and 949 cities.

### Occupational Hygiene Training Association

The basis of OHTA goes back to 2005 when a group of like minded senior occupational hygiene professionals were meeting to discuss how they could meet requirements for worker health protection as emerging economies continued to evolve. Their central belief was that the same standard of control of health and safety risks should be employed wherever the operation might be in the world. This would avoid repeating some of the errors and tragic cases of ill health that arose from the industrial revolution of the 19th and 20th Centuries.

OHTA was established as a not for profit organisation by dedicated occupational hygiene professionals and has matured into an international framework supported by many national occupational hygiene associations and IOHA.

From those initial discussions in 2005, a series of training modules has been developed, peer reviewed and piloted in many countries across the world and now available free of charge via the website of OHTA on www.OHlearning.com.

As the role and activities of OHTA was the subject of a workshop at the 8th International Scientific Conference in Rome 2010, they will not be discussed in detail here except for the concept of qualification levels.

Under the OHTA model three levels of training and education are presented. These are:

- **Foundation level** for those who have studied the basic principles of occupational hygiene
- **Intermediate level** for those who have studied the technical knowledge and practical skills needed to undertake occupational hygiene in the workplace
- **Advanced level** for those who achieve the levels of knowledge and skill expected of a professional hygienist

In terms of assessment, the two lower levels use a formative approach to learning which makes assessment an integral part of the learning process. At the Advanced level, assessment may be part of the academic process for a postgraduate degree or diploma. The scheme can thus serve the needs of students from early technician training through to professional development. It encourages a process of “spiral learning”, where materials are studied to progressively higher levels. The scheme is already in use, with courses held around the world by companies, universities and other training providers.

At the Advanced level, OHTA does not offer its own qualifications as they are available through professional qualifications that have been recognised by the IOHA National Accreditation Recognition Committee (NAR). These are available through national associations such as AIOH and BOHS working in partnership with academic institutions to ensure a mutually acceptable outcome in terms of both academic and professional accreditation.

What OHTA has done is to provide a vehicle where academic programmes at the Advanced level can be developed using the same basic material as the Intermediate level but with the inclusion of a sound underlying academic knowledge and the process of critical thinking and evaluation. This concept is somewhat different to previous academic programmes and opens up opportunities to tailor programmes to industry needs and to prepare students for internationally recognised standards of professional accreditation under NAR.

### Advanced Level Education

Historically, academic programmes in occupational hygiene have been centred on a few key countries in Europe and North America. In many instances this required a prolonged absence from the home country by the student for the purpose of study, thus reducing the availability to prospective employers. With the advent of the internet, online academic programmes evolved and while these have been very successful in many countries, the experience of many in industry has been that they produce graduates with good academic knowledge but limited practical skills. Perhaps one of the unique outcomes of the OHTA project has been the realisation that the basic teaching materials developed for Intermediate level students could be quite easily enhanced with extra material so as to form the basis of an Advanced level (Master of Science) course.

The two examples where this has been done is the MSc Occupational Hygiene Practice (University of Wollongong - Australia) and the MSc Occupational Hygiene (University of Antofagasta - Chile).
Both these programmes use the core modules as a base, however the University of Wollongong programme offers industry specific modules such as Occupational Hygiene in the Oil & Gas Industry and Occupational Hygiene in the Mining Industry. The course in Chile is based on the University of Wollongong course but has a specific module on Hypoxia, a major issue for the mining industry of Northern Chile. Both these programmes have been based on strong linkages between industry and the respective Universities so that graduates have the ability to operate in a productive capacity without the need for further onsite training.

The other unique approach has been the development of a “fly in - fly out” mode of delivery so as to integrate with the normal operating procedures of many industries. The cost in time and expenses to have a student offsite attending a university course a few hours per week or a full year residential is hard to justify in 2010. This is especially the case in remote mining and petroleum operations but one week block format classes can be readily accommodated.

While the face to face teaching may only be one week per subject, considerable effort is required by students to research and compile online assignments followed by an online examination. The face to face teaching is underpinned by extensive practical exercises and where possible worksite visits.

The MSc Occupational Hygiene Practice programme at the University of Wollongong has been accredited by the AIOH and BOHS, thus ensuring professional standards are maintained. The first graduates from this programme had their degrees conferred on 21 July 2010, marking another important milestone in the OHTA model of professional development.

The development of this Advanced level programme has not been without a degree of trial and adjustment. Some of the issues encountered included the following:

• Current undergraduate degrees are very broad in nature and many people gravitating to a career in occupational hygiene do not have a solid grounding in chemistry, mathematics, statistics, etc. This has necessitated the development of pre learning modules in these areas so that students can catch up on the basics before undertaking core subjects

• The linkage of assessment outcomes from postgraduate courses as evidence of competency as per professional association performance criteria is surprisingly not well developed. Bell (Bell, 2008) conducted an extensive review of all IOHA National Accreditation Schemes (NAR) where information was readily available and found that the majority had detailed units of competency (Competency Area) and elements of competency (Examination Performance Criteria) but not necessarily the actual evidence of competency.

Given this finding, there is a clear need for professional societies to clarify their requirements so university assessment outcomes can better reflect evidence of competency.

• Individual industries have specific learning requirements for occupational hygiene students and no course can possibly satisfy all needs. What is clear is at the Advanced level significant effort needs to be focussed on the processes of individual issue research, problem solving, critical thinking and evaluation. The use of specific industry based modules provides an excellent avenue to build on previous basic learnings by application to specific industry processes and issues.

Notwithstanding the above applied requirements, students at the Advanced level should support their knowledge of occupational hygiene with a variety of non technical skills. The University of Wollongong identifies a set of knowledge and skills that can be defined as tertiary literacy:

• Information literacy - the capacity to recognise when information is needed and the capacity to locate, evaluate and effectively use required information

• Computer literacy - the ability to effectively use computer devices and associated peripherals and generic software to find, store, retrieve and manipulate data

• Statistical literacy - the ability to think statistically and to effectively use formal statistical reasoning

• Professional practices - the transfer and application of knowledge, values, attitudes and skills gained from university study to work and life settings including the management of a professional career with the transition from study to work

The challenge that the profession faces is to ensure that education courses not only meet the needs of industry but develop hygienists that have professional values instilled within them and they demonstrate those skills and values in everyday activities.

Conclusion

The success of the OHTA model is due to the foresight and dedication of a group of senior occupational hygienists and the contribution from many occupational hygienists from many parts of the world.

While the initial focus of OHTA has been at the intermediate level as that is the area of immediate need of industry, there is a need to build on the model of the Universities of Wollongong and Antofagasta to develop a strong programme at the Advanced level in those countries without such programmes. This will be a lot slower task than at the Intermediate level but if done in concert with industry partners the benefits to all stakeholders will be significant.

References

